ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 073e

Item: Wide Band Omni-Directional Hydrophones

Vendor: Harris Acoustic Products Corporation

Model: HAP-5050 Wide Band Omni-Directional Hydrophone

Performance:

Features:	Meets vibration requirements of MIL-STD-167 and shock requirements of MIL-S-901C
Operating Frequency Range:	64 Hz –50kHz
Receiving Sensitivity:	- 170 dB re 1V / μPa
Horizontal Beam Pattern:	Omni-directional ± 1 dB
Vertical Beam Pattern:	Equal to 1.75” Line Hydrophone
Depth Capability:	> 2000 feet
Pre-Amp Gain:	+ 20 dB

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 235

Item: Propulsion Motors

Vendor: Ansaldo

Model: Model DHT 900 Z73 FD4 SCO/60H , **or**

Vendor: Teco-Westinghouse

Model: Model 994101JRM

Performance:

Features:	Low voltage direct drive DC, controlled by 12-pulse or 24-pulse SCR type variable speed controllers, reduced power redundancy, full speed control from 0 to maximum rpm ahead and astern
Propulsion Drive Continuous Rating:	2250 kW @ 134 rpm total (tandem) rating
Maximum Above-Mount Vibration Levels:	In accordance with Table 073-3 of SOR
Total Weight:	Equal to or less than 72,000 kg
Overall Dimensions (LWH):	Equal to or less than 8.605 M Length X 3 M Width X 3.745 M Height
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 244d

Item: Stern Tube Bearing

Vendor: Thordon Bearings, Inc.

Model: Thordan COMPAC

Performance:

Features:	Water lubricated, synthetic elastomeric polymer alloy, split journal configuration.
Hardness:	67 Shore D
Tensile strength:	5,500 psi
Shear strength:	4,750 psi
Ultimate elongation:	207% iaw
Water Absorption:	1.3%
Oil swell:	0%
Regulatory Body Approvals for Intended Service:	ABS, USCG
Services:	Integrated water quality package to supply abrasive-free water for bearing lubrication. Self cleaning filter system to assure a supply of filtered water to the bearings. Self-lubricated, water cooled bearings

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423a

Item: DGPS Receiver

Vendor: Leica Geosystems Inc.

Model: MX412B

Performance:

Features:	12 Channel continuous tracking C/A code GPS receiver, DGPS input in RTCM SC-104 format from internal beacon receiver, four bi-directional NMEA 0183 ver. 2.2 RS-422 ports, one configurable to RS-232. Field reprogrammable, 2000 or more waypoints, 100 or more routes, bright 240x128 pixel, back-lit black/white LCD display. MOB (Man overboard) and Mark features. Provides digital output to SCS system.
GPS Receiver:	
Type:	L1 freq, C/A code, 12 Channel continuous tracking
Sensitivity:	-143 dBm Costas threshold
Update Rate:	5 Hz
Accuracy (w/DGPS):	1-5 m 2DRMS Velocity +/- 0.05 m/s depending on correction update rate.
Time to first fix:	15 minutes (cold start), 20 seconds typical
Reacquisition:	5 seconds typical
DGPS input:	RTCM SC-104 format from internal beacon receiver.
Electrical Interfaces:	
Ports:	4 bi-directional NMEA 0183 ver 2.2 RS-422 compatible. One port can be configured as an RS-232 port.
NMEA Inputs:	DPT, DBS, DBK, GLL, HCC, HDM, HDT, MMB, MWV, RMA, RMC, VHW,VTG,VWR, WPL, XDR.
NMEA Outputs:	APA, APB, BOD, BWX, BWR, GGA, GLL, GRS, GSA, GSV, HSC, MSK, MSS, RMB, RMC, ROI,

	RTE, SNU, VDR, VHW, VPW, VTG, WCV, WPL, XTE, ZDA, ZTG.
Pulse Log Emulation:	1-30000 pulses per NM
Reprogramming:	Field programmable flash ROM
Power:	
Input Voltage:	10.5 to 32 VDC, 10 Watts
Grounding:	Chassis isolated from electrical grounds
Environmental:	
Temperature:	Operating: 15 to 55 ° C.
Water Resistance:	Splashproof
Display:	Bright 240x128 pixel, back-lit, black/white LCD
Lat/Long:	Four decimal points.
Waypoints:	2000 with 20 character alphanumeric names.
Routes:	100 routes with dynamic number or waypoints up to a total of 2000 in all routes.
Features:	Mark function MOB function
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423b

Item: Inertial Reference System

Vendor: TSS, Inc.

Model: POS/MV Model 320

Performance:

Features: Rack mountable POS Computer System (PCS), Inertial Measurement Unit (IMU), GPS receivers/antennas and installation and operation software. Capable of receiving DGPS correction. Output data connections to SCS, Scientific Sounder systems and ADCP electronics.

Accuracy:

C/A GPS

Roll, pitch:	0.035 degrees RMS
Heave:	the greater of 5 cm or 5% heave amplitude for periods up to 20 seconds.
True heading:	0.05 degrees
Horizontal position:	15 to 40 m

DGPS

Roll, pitch:	Better than 0.035 degrees RMS
Heave:	the greater of 5 cm or 5% heave amplitude For periods up to 20 seconds.
True heading:	0.05 degrees
Horizontal position:	0.75 to 5 m

RTK

Roll, pitch:	Better than 0.035 degrees RMS
Heave:	The greater of 5 cm or 5% heave amplitude For periods up to 20 seconds.
True heading:	0.05 degrees
Horizontal position:	0.05 to 0.1 m
Vertical position:	0.1 to 0.2 m

Power: 220/120 v 50/60 Hz

Environmental:

Temperature (operating):	IMU:	-20 to +60 degrees C
	PCS:	0 to +50 degrees C

	Antenna:	-40 to +85 degrees C	
	Humidity:	IMU:	Sealed nitrogen filled No limit
		PCS:	10 to 80% non-condensing
		Antenna:	0 to 100%
GPS Channels available:		12	
	Update Rate:	10 Hz maximum	
Data Interface RS232			
	Parameters:	Input:	RTCM-104 corrections
		Output:	Time tag, roll pitch have True heading, velocity NMEA telegrams $INGGA, $INHDT, $INVTG $INGST, $INZDA, $PASHR $PRDID (user selectable 1 TO 50 Hz update)
		Baud Rate:	4800 to 11500 (user selectable)
		Protocol:	User selectable
		Resolution:	Roll, Pitch: 0.01 degrees True Heading: 0.01 degrees Heave: 1 cm
		Ethernet:	10/100 base T

Life Cycle Support Characteristics: Design/ utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability,
including parts/service support, training,
technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423d

Item: Doppler Speed Log System

Vendor: Sperry Marine, Inc.

Model: SRD-500

Performance:

Features:	Dual axis Doppler speed log, providing speed through the water. Unit must comply with IMO Resolution A.478(XII). Minimum water depth for speed determination, 3 meters. Simultaneous water and bottom tracking to 200 meters. Provides serial output to the SCS and pulses/NM to radar.
Range:	
Water Lock:	3m minimum depth under transducer
Bottom Lock:	1.2 to 200 m depth under transducer
Speed (Fore/Aft):	+50 to -20 Knots
(Port/Stbd):	+/- 10 Knots
Frequency:	307 kHz, 4 beams
Accuracy:	
Speed:	+/- 0.1 Knots
Distance traveled:	+/- 1% NM
Depth under hull:	+/- 2% fathoms, meters, feet.
Outputs:	
Relay:	Five independent contacts
Distance Format:	400, 200 or 10 pulses/NM
Serial:	RS232 or RS422, NMEA 0183
Analog:	1 ma full scale or 0.1 v/knot
Power:	115/230 vAC (=/- 10%), 50/50 Hz
Transducer:	203 mm diameter, 4 element

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423d

Item: Electromagnetic Speed Log System

Vendor: Aeronautical & General Instruments LTD

Model: EM2000

Performance:

Features:	Electromagnetic speed log consisting of main electronic unit (MEU), use interface panel (UIP), digital and analog repeaters, and flush mount hull sensor. Provides speed, fore/aft, distance travelled log. Provides serial output to the SCS and pulse/NM to radar.
Sensor:	Hull mounted, either flush mount or minimally protruding.
Speed Range:	-10 to +40 Knots
Speed Accuracy:	+/- 0.1 Knot
Distance display:	99999.99 NM, resettable
Resolution:	
UIP and Digital Repeater:	0.1 Knot
Analog Repeater:	1 Knot
Outputs:	Four potential free contacts: Pulses/NM, alarms, fault. RS-422 serial Analog voltage 0.1v/Knot
Power:	115/230 vAC 60 Hz, 100VA
Life Cycle Support Characteristics:	Design/utilization for marine service Demonstrated reliability in marine environment Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423e

Item: Gyrocompass System

Vendor: Sperry Marine, Inc.

Model: Mk 37 VT with Bearing Stands and Repeaters

Performance:

Features:	Gyrocompass, providing serial output to the SCS and synchronous/step outputs to repeaters.
Specifications:	
Linear Mean Settle Point Error:	=/- 0.19 ° Secant Latitude
Scorsby Error:	0.90 ° Secant Latitude
Master Compass Ang. Freedom:	Better than +/- 45 ° in pitch and roll.
Speed correction:	Manual or auto with speed log input
Latitude correction:	Manual or auto with GPS input
Settle Time:	Less than 5 hours unaided
Inputs:	
Serial:	one RS232, one RS422
Speed:	NMEA 0183 VHW or VBW sentences 200 Pulses/MN contact closure
Latitude/Longitude:	NMEA 0183 GCA or GLL sentences
Outputs:	
Serial:	one RS232, one RS422 NMEA 0183 format RS232 can drive one load RS422 can drive up to ten loads
Step:	Eight outputs, 24 VDC, 6 steps /degree
Synchronous:	standard
Rate of turn:	one analog, -50 mV/degree/minute (+/- 4.5 volts FS = +/- 90 degrees/min) drives up to three indicators.
Power Failure Alarm:	relay contacts
Compass Failure Alarm:	relay contacts
Power:	115/230 VAC, +/- 10%, 47-64 Hz
Battery Backup:	24 VDC Battery backup system

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 423h

Item: Master Clock System

Vendor: Datum, Inc

Model: Tymserve 2100-GPS Network Time Server

Performance:

Features:	Standalone NTP Network time server providing time output in various forms to keep the clocks in all computers connected to the network on the same time. Network Management Protocol. Independent Time Acquisition from GPS and IRIG Time code. Has built in GPS receiver. Unit will also provide an output to the SCS. Provides outputs for time in several forms in addition to the network protocols, TCP/IP, SNTP, SMNP and BOOTP as a minimum. Two serial outputs in addition to the network connection allow all computers on the ship to be in sync.
Characteristics:	
Frequency Stability:	VCXO; 1x 10^{-8}/day aging
Timing Accuracy:	
Network:	1-10 msec, typical
GPS:	< 2 microsec, relative to UTC
IRIG B Time Code:	< 5 microsec, relative to code
GPS:	six channel, C/A code receiver
Acquisition:	< 5 minutes
Outputs:	
Time code:	IRIG B, Modulated 3:1, 3V p-p, 75 Ω BNC connector IRIG B, Differential TTL, DCLS, 50Ω DB9 connector
1 PPS:	TTL, Rising edge on-time, 50Ω BNC connector
Frequency:	10 MHz, 50Ω, square wave with VXCO

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Inputs:	
Time Code:	IRIG A, IRIG B, NASA 36 (modulated 2:1 to 6:1) 500 mV to 10 V p-p, .10KΩ BNC connector IRIG A, IRIG B, NASA 36 Differential TTL, DCLS, 1KΩ DB9 connector
1 PPS:	TTL, Active rising or falling, HD-15 connector
GPS	Antenna/preamp, SMA connector
Input/Output Connections:	
Network:	AUI Ethernet 10BaseT Ethernet
Serial Port 1:	RS-232/DB9, DTE, Sysplex Timer, Ext. Modem
Serial Port 2:	RS-232/DB9, DCE, Configuration and status
Power:	95 to 265 VAC, 47 to 63 Hz
Operating Temperature:	0 to 50 deg C
Relative Humidity:	0 to 95% (non-condensing)
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 432b

Item: Digital Dial Telephone System

Vendor: InterTelCom

Model: Comdial Model DXP Plus

Performance:

Features: Operator free dialing and communication for both incoming and outgoing calls between the outside lines, INMARSAT B terminals, satellite communication system, cellular phone, SEAPHONE, and the station connections identified in the SOR. Permanently installed stations in the weather watertight and equipped with an external bell. Positive restraining devices for telephone handsets. FCC Registration.

System Capacity:

Min# of Lines:	24
Min # of Stations:	80
Intercom Paths:	Nonblocking
Expansion Module Capacity:	up to 112 stations
Power Fail Circuits:	1
SMDA Storage:	1600

Power Requirements

AC power	90-129 VAC

Switching Principle: Digital, pulse code modulated-time division multiplexed (PCM-TDM)

Operating Environment:

Temperature:	0 - 50°C
Humidity:	90%, non-condensing

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 441

Item: VHF Radiotelephone Survival Craft Radio

Vendor: ACR Electronics

Model: 2727

Performance:

Features:	Multi-channel VHF GMDSS survival craft radio. Operates on all maritime Simplex channels, including receiving weather. Floats if dropped in water. Highly visible yellow waterproof to 10 ft.
Characteristics:	
Frequency Range:	156 to 162 MHz
No of channels:	57 or more
Frequency Stability:	0.001 %
Modulation System:	phase
Operating Time:	8 hours minimum
Receiver:	
Sensitivity:	1 μV (12 dB SINAD)
Audio Response:	300 – 2750 Hz
Audio output Power:	200 mW
Squelch Sensivity:	2 μV
Distortion:	<10 % THD
Transmitter:	
RF Output Power:	500 mW
Class of Emission:	16KOG3E

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 441

Item: INMARSAT C

Vendor: Trimble

Model: 70001-Galaxy Inmarsat-C/GPS Marine

Performance:

Features:	Inmarsat-C Ship Earth Station with embedded GPS receiver, integrated Enhanced Group Call(ECG). Can report position of platform via message-mode, polling or data reporting service including sending a position report when power is disabled and reconnected or antenna is disabled.

Characteristics:

Transceiver:

Transmit Frequency:	1,626.5 - 1,646.5 MHz
Receive Frequency:	1,530.0 - 1,545.0 MHz
G/T:	-23 dB/°K
EIRP:	14 ± 2 dBW
Data Rate:	600 Baud
Type Approval:	Inmarsat, IT-04-023-01 FCC, JUP7001-MG
Power:	9.6 – 31.2 VDC 12 W receive 110W transmit
Operating Temperature:	-25° C to +55° C
Vibration:	5-20 Hz, 0.005 g^2/Hz 20-150 Hz –3dB/octave

Antenna:

Operating Temperature:	-35° C to +55° C
Vibration:	5-20 Hz, 0.005g^2/Hz 20-150 Hz, -3 dBW/octave

Interfaces:

DTE:	RS-232
GPS	RS-422
Printer	RS-232

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

GPS:	
Receiver:	1.575.42 MHZ
Satellites tracked:	8
Update Rate	1/secong
Acquisition time	< 2 Min, 2 dimensional
Re-acquisition time:	< 8 seconds
Accuracy:	
Position:	15m RMS
Velocity;	0.2 km/hr RMS

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 441

Item: Satellite Communication System

Vendor: Westinghouse Electric

Model: Westinghouse Model 1000 + Wavetalk

Performance:

Features:	Satellite phone system providing digital voice, facsimile and data communications. Uses MobileSat system. Coverage must include area up to 200 nm off continental US west coast, Alaska and Canada. Data rates of 4800 baud and facsimile transmissions of Group III at 2400 bps.
Communication Modes:	
Voice:	Full Duplex Digital
Data:	4800 bps Full Duplex
Fax:	Group 3 at 2400 bps.
Mobilsat System:	
Transmit Frequencies:	1646.5 - 1660.5 MHz
Receive Frequencies:	1545.0 - 1559.0 MHz
G/T:	-18 dB/K from 15° - 60° elevation
EIRP:	12.5 - 16.5 dbW
Channel Spacing:	6 kHz
Interface:	
Voice:	Connection to PBX
Data::	4800 bps, Rs-232, Hayes AT compatible
Fax::	Two wire
Power:	11.5 - 15.6 VDC
Dynamic/Environmental conditions:	
Operational:	
Turning Rate:	70° / sec
Acceleration Rate:	500° / sec^2

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461a

Item: Scientific Sounder System

Vendor: Kongsberg Simrad

Model: EK-60

Performance:

Features: It must have performance, features, and capability equal to or exceeding the EK500-BI500 system currently in use by NMFS. It must produce data output that can be directly input into the standard fisheries database (i.e. Oracle). The processed data format and organization must be compatible with the current NMFS midwater acoustic database

Refer to SOR Section 461a for description of salient technical features.

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461b

Item: Acoustic Doppler Current Profiler (ADCP)

Vendor: RD Instruments

Model: Ocean Surveyor

Performance:

Features: Vessel Mount Phased Array ADCP, consisting of a transducer assembly, a deck unit and an acquisition and display system. Operates at 75 kHz, equipped with speed log capability, and remote display of speed at the SCC. Connected with the Scientific Sounder system. Capability to receive inputs from the Inertial Reference System, GPS and gyrocompass, and to output data from the acquisition and display system to the SCS. User selectable high precision pulse-coherent (broadband) and/or pulse-incoherent (narrowband) processing, and user adaptable Windows based DAS software. Rack mounted electronic chassis.

Transducer:	
Frequency:	75kHz flat face phased array, installed on the bottom of the centerboard
Water Velocity:	
Profiling Range (m):	650 Narrowband mode, 450 Broadband mode
Precision:	
Narrowband mode:	32 cm/s @ 8m Bin, 16 cm/s @ 16m Bin, 8 cm/s @ 32m Bin
Broadband mode:	12 cm/s @ 8m Bin, 8 cm/s @ 16m Bin, 6 cm/s @ 32m Bin
Long Term Accuracy:	$\pm$1.0% $\pm$ 0.2 cm/s
Velocity Range:	-5 to 20 m/s
Maximum Ping Rate:	1/(0.9 + 0.0019R) (R = Range in meters)
Data Communication:	
Interface:	RS-232 or RS-422 serial @ 1200 – 115,200 baud
Data Format:	HEX-ASCII or Binary
Environmental:	
Temperature:	-5 to 60°C (operating), -50 to 80°C (storage)

Humidity:	Non-condensing
Vibration:	MIL-STD-167-1, Type 1, IEC-945 Section 4.4.7
Bottom Velocity:	
Bottom Track Max. Altitude:	950 m
Precision (statistical uncertainty of horizontal velocities for single ping:	0.7 @ 1m/s vessel velocity; 1.3 @ 3m/s vessel velocity; 1.6 @ 5m/s vessel velocity
Long Term Accuracy:	±1.0%±0.2 cm/s
Velocity range:	-5 to 20 m/s
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461c

Item: Acoustic Net Mensuration System

Vendor: Northstar Technical, Inc.

Model: NetMind

Performance:

Features: Consists of an integrated deck unit, two 28 kHZ transducers, headline height sensor, two trawl door spread sensors, a depth sensor, a temperature sensor, one catch sensor and one battery charger. Underwater sensors certified for operation to at least 1200 fathoms depth. Provide input to scientific sounder system, available data output to SCS.

Deck Unit:

Computer Interface: Serial RS-232
Data Logging: Available for all sensors
Software operating requirements:

- PC with Windows
- Dedicated serial port

Towed Hydrophone:

Beam Pattern: 50° Conical

Hull Mounted Hydrophone:

Beam Pattern: 50° Conical

SENSORS:

Telemetry range: 2 Km (1.5 Miles)
Operating Depth: 1200 Fathoms

Battery Life: 150 hours
Telemetry Frequency: 27.7 to 29.9 kHz

Catch Sensor:

Measurement: Net expansion (indicates when net is full).

Depth Sensor:

Measurement: Depth (pressure).
Measurement Range: 0 to 1200 Fathoms)
Accuracy: ±1% of full scale.

Door Spread Sensor Pair:
- Measurement: Distance between master and slave sensor.
- Measurement range: 150m (500 ft)
- Accuracy: ± 1% of full scale.
- Measurement Frequency: 90 kHz

Wing Spread Sensor Pair:
- Measurement: Distance between master and slave sensor.
- Measurement range: 70m (250 ft)
- Accuracy: ± 1% of full scale

Headline Sensor:
- Measurement: Distance from headline to bottom
  Distance from headline to footrope
  Relative fish density in net opening.
- Measurement range: 60m (200 ft)
- Accuracy: ±1% of full scale.
- Measurement Frequency: 200 kHz

Temperature Sensor:
- Measurement: Water Temperature
- Measurement Range: -2°C to +30°C
- Accuracy: ±0.1°C

Grid Sensor:
- Measurement: Tilt
- Measurement Range: 0° to 90°
- Accuracy: ±1°

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461d

Item: Net Sonde System

Vendor: Wesmar

Model: Model TCS700E, **or**

Vendor: Simrad

Model: FS925

Performance:

Features: Third wire trawl monitor system. System provides real-time imaging and data. Capability to provide vertical net scanning, horizontal scanning, vertical depth sounding and head rope unit temperature and depth readout. Capability to provide measurement of the net opening, door spread and fish activity at the net opening. Vertical scanning, forward profiling, sounding and temperature provided in one head rope unit. Capability for data output to remote computer systems. Comprised of display unit, processor, power supply, head rope unit and one catch sensor.

System:
- Power: 120/240 Vac 50/60 Hz
- Monitor: VGA (640X480)(minimum)
- Readout: Digital (Depth and Temperature of head rope unit.)

Environmental
- Depth rating: 2500 meters (maximum)

Data Interface RS232
- Parameters:
  - Output: 1 TO 50 Hz update
  - Baud rate: 300 to 9600 baud (user selectable)
  - Protocol: ASCII, NMEA (user selectable)

Life Cycle Support Characteristics: Design/ utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability,
including parts/service support, training,
technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461e

Item: Fish Finding System

Vendor: Kongsberg Simrad

Model: ES60

Performance:

Features:	Dual frequency fisheries sounder, 50 kHz and 200 kHz, color LCD monitor, color printer, two high resolution transducers. Capable of receiving input from the Inertial Reference System, GPS, and providing output to the SCS.
Transceiver:	
Frequency:	50 kHz and 200 kHz
Power output:	Variable up to 1 KW per channel
Ranges:	Minimum range, 5 m Maximum range, 5000 m 8 ranges minimum
Phasing:	Manual or automatic
Bottom Expansion:	Minimum, 5 m Maximum, 5000 m Variable ranging
Sound Velocity:	1400 to 1700 m/s, variable
Display Presentations:	
A-scope:	Screen, layer or expanded area
Echogram:	Dual side by side Dual vertically, Single full screen Single with bottom expansion
LCD Display:	18" LCD display flat panel
Transducers:	50 kHz high resolution 200 kHz high resolution
Outputs:	
Serial:	NMEA 0183, bottom depth

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Inputs:	
Serial:	NMEA 0183 trawl depth NMEA 0183 trawl height NMEA 0183 Lat/Long from GPS
Internal Memory Storage:	Records on hard disk Up to 400 pages of Echograms
Power:	95-265 VAC
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461f

Item: Multibeam Echo Sounder System

Vendor: Kongsberg Simrad Mesotech

Model: SM 2000

Performance:

Features:	Software controlled system that allows operator to optimize the system for any given application (swath width, range resolution, along track resolution, across track resolution). Includes ability to perform fine resolution volumetric measurements of water column objects.
Subsurface Unit:	
Operating Frequency:	90.9 kHz
Beamwidth:	120° (1.5° beam width across track, at 0.94° beam spacing); used in conjunction with narrow beam projector, provides 1.5° along track beamwidth, with up to 120° across track coverage
Dimensions:	240mm height X 600 mm width
Weight:	10.7 kg in-water
Ping Rates:	Up to 15/sec. on shortest ranges
Receive bandwidth/sample rates:	configured by the operating system software
Telemetry Rates:	Variable from 833k to 10 Mb/s
Surface Processor:	Ruggedized, industrial-type Pentium PC, with 3.5 inch floppy drive, Hard drive, CD Rom, VGA video system minimum, plus: 1. Kongsberg Simrad Mesotech Surface Telemetry Board 2. Kongsberg Simrad Mesotech Beamformer Board 3. Kongsberg Simrad Mesotech Video Image Board
Operating System:	WINDOWS 95 minimum Allows Screen overlays and text annotation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

User Controls:	Swath width, range resolution, along track resolution, across track resolution, number of beams
System Interfaces:	
Surface Unit Serial Inputs:	Motion sensor (heave, pitch and roll) in TSS or Seatex formats Position, heading, time in NMEA formats User defined serial input data Remote system control
Surface Unit Serial Outputs:	Profile data Remote Control Output
Surface Unit Printer Output:	To color graphic printer
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461g

Item: Passive Sonar Transducer

Vendor: Airmar Technology Corp.

Model: 41-065-1-01, **or**

Vendor: International Transducer Corp

Model: ITC-5008

Performance:

Features:	12 kHz broad beamwidth high power transducer to be mounted in the hull. Nickel-Bronze or Stainless Steel housing.
Transducer Characteristics:	
Frequency:	12 kHz center frequency
Elements:	Ceramic
Impedance (ohms):	150 to 225
Beam Pattern:	Conical 32° to 40° at 12 kHz
Input Power:	2000 Watts
Transmit Voltage Response:	< 155 dB re 1μPa/Volt at 1 meter
Receive Response (open crt):	< 160 dB re 1 Volt/μPa
Cable:	10 meters or more.
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 461h

Item: Acoustic Release Transducer

Vendor: Edgetech

Model: 8012A

Performance:

Features:	Omni-directional transducer to be mounted in the centerboard to provide a signal to a submerged acoustic release.
Transducer Characteristics:	
Frequency:	7.5 to 15 kHz
Beam Pattern:	Omni-directional
Size:	12 cm dia. (4.7 in dia.) 10 cm height, (3.9 in.)
Cable Length:	67 meters
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493f

Item: Temperature Sensor

Vendor: Sea-Bird Electronics

Model: SBE 3

Performance:

Features:	Located in scientific seawater system common seachest header, as close as possible to shell
Range:	-5.0 to + 35° C.
Initial Accuracy:	± 0.001° C (NIST-traceable calibration applying over the entire oceanographic range)
Stability:	0.002°C per year typical
Response Time [seconds]: (time to reach 63% of final value following a step change In temperature)	0.580 ± 0.010 (1.0 m/s water velocity) 0.690 ± 0.010 (0.5 m/s water velocity)
Self-heating Error:	<0.0001°C in still water
Settling Time:	<0.5 sec. To within 0.001°C
Signal output:	±0.5V square wave
Housing:	6061 aluminum

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493f

Item: Thermosalinograph

Vendor: Sea-Bird Electronics

Model: SBE 21

Performance:

Features:	Located in the Chemistry Laboratory. Provided with input from the Computer Laboratory GPS unit and from the scientific seawater system flow meter. Capability to compute, tabulate and plot salinity, density, sound velocity and other variables using PC compatible software supplied with unit.
Measurement Range:	
Conductivity:	0 – 7 S/m (0 –70 mmho/cm)
Temperature, primary (°C):	-5 to +35
Temperature, remote (°C):	-5 to +35
Initial Accuracy:	
Conductivity:	±0.001 S/m (±0.01 mmho/cm)
Temperature, primary (°C):	±0.01
Temperature, remote (°C):	±0.01
Resolution:	
Conductivity:	±0.0001 S/m (±0.001 mmho/cm)
Temperature, primary (°C):	±0.001
Temperature, remote (°C):	±0.001
Sample interval:	5 seconds or longer in steps of 1 second
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493f

Item: Continuous Flow Fluorometer

Vendor: Turner Designs

Model: 10-AU-005

Performance:

Features:	Provided in a NEMA 4 enclosure and connected to a flow controlled branch line in the scientific seawater system. Easily removable watertight filter paddles, manual or automatic range changing in response to changing (user selectable) concentration levels. Located in the Chemistry Laboratory.
Sensitivity:	10 parts per trillion of Rhodamine WT in potable water; 30 parts per trillion of extracted chlorophyll a; 10 parts per billion of crude oil in pure water
Dual Beam Optics:	Compensate for drift in lamp intensity and/or photomultiplier drift.
Ranges:	3 ranges, each a factor of 10 more sensitive than the next, 0 to 9999.999, fluorescent signal units
Operating Temperature:	0 - 55°C (ambient)
Software:	Menu-driven microprocessor-controlled
Readout:	Direct Concentration or Raw Fluorescence
Discrete Sample Averaging (user selectable):	Pre-averaging delay, 1-60 seconds; Averaging period, 2-60 seconds
Alarm:	Audible and visible when fluorescence of sample falls below or exceeds user-selectable limits. Alarm delay time, 10-3600 seconds
Diagnostics:	Diagnostic screen displays status of internal instrument electronics

Life Cycle Support Characteristics: Design/utilization for marine service

	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493f

Item: Flow Sensor

Vendor: Signet Scientific Co.

Model: +GF+Signet 515 Rotor-X

Performance:

Features:	Located in the Scientific Seawater system common seachest header. Output connected to one of the auxiliary analog input channels of the thermosalinograph.
Operating Range:	1 to 20 ft/s
Repeatability:	+/-0.5% of full range
Linearity:	1% of full range
Quality Standards:	CE, FM (Class I, II, III/Div.1/Groups A-G)

Life Cycle Support Characteristics:

Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493f

Item: Flow Indicator

Vendor: Signet Scientific Co.

Model: +GF+Signet 5500 Flow ProPoint

Performance:

Features:	One unit installed near the flow sensor, one unit installed in the Computer Laboratory. Output of one flow monitor connected to thermosalinograph. Alarm annunciator located in the Chemistry Laboratory.
Operating Range:	0.5 to 10 kHz, optically isolated
Current Output:	
Accuracy:	+/- 0.1%
Update Rate:	100 msec
Additional Functions:	Sensor Pulse, Count Pulse, Remote totalizer reset
Operating Conditions:	
Temperature:	– 14 to 131 degrees F
Relative Humidity:	0 – 95%, non-condensing
Accuracy:	+/-0.5% of reading
Materials:	
Enclosure:	ABS Plastic, NEMA 4X/IP65 Panel and Case
Window:	Hard-coated polycarbonate
Immunity:	EN50082-2
Emissions:	EN55011
Safety:	EN61010-1
Quality Standards:	CE, CSA, UL

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Electronic Air Temperature Sensing Unit

Vendor: RM Young

Model: 41342

Performance:

Features:	Air Temperature sensor for connection to the RM Young 26700 Programmable Translator. Fits in a radiation shield. Information provided to SCS.
Sensor Characteristics:	
Temperature range:	-50° to + 60° C.
Accuracy	+/- 0.3° C
Sensor Type:	1000 W Platinum RTD
Output Signal:	0-1 VDC
Power Required:	8-24 VDC

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Solar Radiation Unit - Precision Pyranometer

Vendor: Epply Laboratories

Model: PSP

Performance:

Features:	Precision Pyranometer . Measures short wave length solar radiation (0.3 to 3 μm). Provides analog output proportional to the incident short wave length solar radiation to RM Young programmable translator.
Characteristics:	Circular 1 cm-2, coated with Parsons' black optical lacquer
Range:	0 – 1400 Watts/meter^2
Sensitivity:	9 μV/watt meter^{-2}
Impedance:	650 Ω
Linearity:	+/- 0.5 % 0 to 2800 watts m^{-2}
Temperature Dependence:	+/- 1 %, -20° to 40° C
Response Time:	1 seconds

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Solar Radiation Unit - Precision Infrared Radiometer (Pyrgeometer)

Vendor: Epply Laboratories

Model: PIR

Performance:

Features:	Precision Infrared Radiometer (pyrgeometer). Measures the long wave length solar radiation (3.0 to 100 μm). Provides analog output propotional to the incident long wave length solar radiation to RM Young programmable translator.
Characteristics:	
Sensitivity:	4 μV/watt meter^{-2}
Impedance:	700 Ω
Linearity:	+/- 1 % 0 to 700 watts m^{-2}
Temperature Dependence:	+/- 2 %, -20° to 40° C
Response Time:	2 seconds
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Humidity Sensing Unit

Vendor: Rotronics

Model: TM 12R-S

Performance:

Features:	Humidity sensor providing analog output to RM Young programmable translator.
Humidity:	
Range:	0-100 % RH
Accuracy:	+/- 2 % RH
Hysteresis:	0.3 % RH
Repeatability:	0.6 % RH or better
Long Term Stability:	0.5 % RH or better over one year
Time constant:	10 seconds or better
Probe Material:	PTFE
Temperature:	Pt 100 RTD sensor
Range:	-30° to 70° C
Accuracy:	+/- 0.5° C.
Time constant:	10 seconds or better
Output:	Two 0-5 VDC analog Min Load 100 kΩs

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Wind Speed and Direction Sensing Unit

Vendor: R.M. Young

Model: 5106

Performance:

Features:	Marine Wind Sensor providing wind speed and wind direction to the RM Young 26700 Programmable Translator.
Sensor Characteristics:	
Wind Speed:	
Range:	0- 60 m/s (134 mph)
Gust Survival:	100 m/s
Azimuth:	360° mechanical, 355° electrical
Accuracy:	
Wind Speed:	+/- 0.3 m/s
Wind Direction:	+/- 3°
Threshold:	
Propeller:	1.1 m/s
Vane:	1.3 m/s
Signal Output:	
Wind Speed:	Magnetically induced AC voltage, 3 pulses/revolution 1800 rpm = 8.8 m/s
Azimuth:	Analog DC voltage on 10kΩ potentiometer, linear to 0.25%
Power Required:	15 VDC
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Display Unit/Programmable Translator

Vendor: R.M. Young

Model: 26700

Performance:

Features:	Translator for R.M. Young meteorological sensors; wind speed/direction and temperature, and other meteorological equipment; Solar radiation sensors, both PSP and PIR, humidity sensor. Accepts interface modules that connect to sensors. Provides serial output to SCS.
Input modules required:	
26725 - wind speed /direction:	3 input channels 0 to 5 VDC
Accuracy	0.1%
26726 - Temperature sensor:	2 input channels for Platinum RTD, 100Ω
Accuracy:	0.03° C
Resolution:	0.01° C
26727 - Voltage input:	4 single ended
Input Signal:	+/- 50 mV, +/- 500 mV, +/- 5000 mV.
Accuracy:	0.1 %
Resolution:	0.02 %
Output:	
Serial Interface, RS-232:	300 to 9600 Baud
Power Required:	7-30 VDC, 8W

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Meteorological Equipment
Barometric Sensing Unit

Vendor: Atmospheric Instrument Research

Model: AIR-DB-1B

Performance:

Features:	Weather resistant barometer. Measures the atmospheric pressure and provides serial output to SCS.
Pressure:	
Range:	600 to 1100 mb
Accuracy:	+/- 0.5 mb
Resolution:	0.01 mb
Maximum Operating Pressure:	1300 mb
Sampling Rate:	10/second
Averaging profiles:	1, 10, 100 and 1000 samples/average
Output:	
Interface:	RS-232, up to 9600 Baud
Format:	Serial ASCII
Power:	RS-232, +11 to +16 VDC, -11 to -16 VDC
Temperature Range:	+ 5° to +40° C

Life Cycle Support Characteristics: Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 493g

Item: Navigational System Wind Speed and Direction Sensing Unit

Vendor: Belfort Industries

Model: Aerovane 4-120
and 135 Display

Performance:

Features:	Dual wind speed/direction sensors for use in navigating the ship. Mounting is critical, only one can be in structural shadow at a time. Display must be mounted so it can be visible from any point on the bridge.
Sensor Characteristics:	
Wind speed:	
Range:	0 - 140 mph (0 – 62.6 m/s)
Acccuracy:	+/- 1 mph (=/- 0.45 m/s)
Starting threshold:	2.0 mph (0.9 m/s)
Output	Linear voltage,
Wind Direction:	
Range;	0 to 360°
Accuracy:	+/- 2°
Output:	115 v, 60 Hz Synchro signal.
Display:	
Wind Speed:	
Range:	0 – 120 knots
System Accuracy:	+/- 1.0 mph
System threshold:	2.0 mph).9 m/s)
Input:	0.1056 V/mph (0.05m/sec)
Wind Direction:`	
Range:	0 to 360°
System Accuracy:	+/- 2° or better
Input:	angular positions from 115 V, 60 Hz Synchro.

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 562

Item: Rudder Bearings

Vendor: Thordon Bearings, Inc.

Model: Thordon SXL

Performance:

Features:	Self-lubricating, non-metallic
Hardness:	67 Shore D
Tensile strength:	5,500 psi
Shear strength:	4,750 psi
Ultimate elongation:	207%
Water Absorption:	1.3%
Oil swell:	0%
Regulatory Body Approval:	Guarantee to meet Classification Society wear specifications for 10 year period

Life Cycle Support Characteristics:

Design/utilization for marine service

Demonstrated reliability in marine environment

Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 591i

Item: Oceanographic Winch

Vendor: Markey Machinery Company

Model: DUSR-11 Storage Winch, DUTW-11 Traction Winder, AC/hydraulic Power Unit

Performance:

Features: Electro-hydraulic oceanographic Traction Winch System capable of handling 17 mm (0.680 inch) diameter electromechanical cable, 17 mm (0.681 inch) fiber-optic cable, and 16 mm (5/8 inch) diameter 3x19 torque balanced wire rope, with no changes other than substitution of Lebus grooved shell and fairlead sprocket changes.

System provided with a 1219 mm auxiliary pivoting sheave, equipped with a tension-sensing output load cell and speed sensors, above and forward of the net reel, in direct line with the traction winder output. The wire entry point to this sheave shall not change position as the sheave pivots to serve alternative overboard locations. Also provided with a 2000 mm circumference counterbalanced overboard sheave on the stern gantry.

Oceanographic winch provided with 3,500 meters of 16 mm (5/8 inch) diameter 3 x 19 wire rope and matching Lebus grooved shell. Provided with an automatic cable washing and lubrication system.

Storage Winch: Minimum barrel diameter of 1219 mm, fitted with a nominal Lebus shell groove root diamter of 1237 mm. Capacity 3,500 meters of 17 mm (0.680 inch) diameter electromechanical cable, 3,500 m of 17 mm (0.681 inch) fiber-optic cable, or 3,500 m of 16 mm (5/8 inch) diameter 3x19 torque balanced wire rope. Equipped with a chain and diamond-screw type positive level-wind fairlead, incorporating a 1219 mm diameter counterbalanced sheave with integral load-cell. Equipped with precision-ratio change-sprockets to permit matching the traverse rate of the fairlead to the pitch of the installed Lebus shell.

	Fitted with a manual clutch and handwheel to permit head positioning and adjustment at maximum tension. Rated at 1364 kg pull at 30.5 m/min, with decreasing pull to a light-line speed of 91.5 m/min. Equipped with a hydraulic piston motor, a spring-set parking brake, a spring-set clutch, and a manual-pump-set caliper-disc brake. Layer compensation provided by the drive and instrumentation sub-system, with adjustable uniform spooling tension between 455 kg and 1364 kg and the same selected speed on each layer. Spooling tension maintained between the storage winch and traction winder, even when stopped. Line tension selectable at a PLC incorporated in the hydraulic power unit (HPU). Fitted with a four-conductor slip-ring unit, such as Meridian Laboratory Model MXO-4, with a marine connector such as a Burton type. Provided with cable passthrough, armor clamping, and conductor access into the hollow main shaft. Capable of accommodating a future fiber optic slip ring assembly. Storage winch surfaces sandblasted, inorganic zinc coated, with epoxy top coat.
Traction winder:	Equipped with dual 1219 mm root diameter, six-groove traction wheels with interchangeable forged-alloy overhung rims. Mechanical connection of the traction wheel, and use of straddle-mount bearings precluded. Wheel grooves shaped to suit the three wire sizes specified for the storage winch. Wheel configuration such as to not induce twist into the cable. Output performance up to 13,636 kg line pull at speeds from creep up to 30.5 m/min, with decreasing pull to "light-line" pull of 4535 kg at 91.5 m/min. Provided with caliper/disc brakes with hand pumps.
Hydraulic Power Unit:	The hydraulic power unit shall integrate a 112 kW, NEMA-B Continuous Duty AC motor, non-reversing soft-start motor controller, hydraulic pumps, hydraulic fluid reservoir with fittings, and a system interface box with digital controller. The HPU shall be framed for handling as a single unit.

Weights:

Storage Winch:	5455 kg
Traction Winch:	7275 kg
HPU:	2275 kg

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 591j

Item: Hydrographic Winches

Vendor: Markey Machinery Company

Model: DESH-6

Performance:

Features:

Each winch powered by a variable frequency AC drive motor and dual range gearing. Regenerative braking provided. A the mid-length layer line pull up to 3,636 kg at line speeds from creep to 50 m/min, with a light-line pull up to 1209 kg at speeds from creep to 101 m/min. Winch drums capacity of 3,500 m of 9.5 mm (0.375 inch) diameter electromechanical cable. Winch drums minimum barrel diameter of 457 mm removable, without disturbing the brake or clutch. Equipped with 3,500 meters of 9.5 mm (0.375 inch) torque balanced, single conductor, electromechanical cable. A Lebus shell and Markey chain driven diamond drive level-winding system shall be provided for each winch. A four-conductor slip ring unit, slip-ring unit, such as Meridian Laboratory Model MXO-4 shall be installed on each winch. Hydrographic winches provided with three-sheave fairlead heads with sensors to provide signals for line speed, tension, and line out. Capability of fairlead head to support a 1000 mm circumference measuring sheave, two guide sheaves and adjustable front guide rollers. The fairlead head shall be capable of adjustment of 15 degrees from horizontal. Winches provided with pneumatic cylinders incorporated into the drum brake for remote operation via valves such as those manufactured by WAB Company. The speed range and fairlead clutches manually operated at the winch. Automatic cable washing and lubrication system for each hydrographic winch. Winch surfaces to be sandblased, coated with an inorganic zinc, with epoxy top coat. Fittings to be non-corrosive.

Weight: 6820 kg

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation

ATTACHMENT J-3 BRAND NAME OR EQUAL EQUIPMENT
SALIENT CHARACTERISTICS

SOR Section: 591I

Item: Winch Monitor/Control System Display Unit

Vendor: Measurement Technology NW

Model: LCI-90

Performance:

Features:	Monitors the amount of cable deployed from the winch, speed at which it is being deployed or retrieved and the tension in the electromechanical cable. In addition the angle that the cable is entering the water is needed on certain types of tows. Information deployed locally, at winch operator station, and to remote displays at locations, such as the bridge or trawl station. Sensors provide analog inputs to the system. Provides serial data to SCS. Display must be readable in high light and sunlight conditions and in a waterproof enclosure.
Characteristics:	
Display:	Electroluminescent display readable in all light conditions including bright sunlight.
Size:	320x240 graphic or larger.
Enclosure:	NEMA 4X with NEMA 4X front panel
Size:	No larger than 7”H x 11”W x 7” D
Power Required:	18-36 VDC
Inputs:	
Analog:	4 or more channels, 0-5 VDC, strain gauge
Count:	Quadrature encoder, 5, 12-24 VDC Proximity, Inductive Proximity, Hall Effect 10 kHz bandwidth
Outputs:	
Serial:	RS-485, isolated
Digital:	4 channels, opto modules, DC input or output, dry contact
Analog:	2 channels, 0-10 VDC

Sensors:	strain gauge, proximity switch, quadrature encoder, contact relay
Excitation:	Regulated 12 VDC and 5VDC 0.2A total Unregulated 24 VDC
Alarms:	Tension, Payout and Speed Can set both high and low setpoints.
Life Cycle Support Characteristics:	Design/utilization for marine service
	Demonstrated reliability in marine environment
	Demonstrated maintainability, including parts/ service support, training, technical documentation